Adaptive optics wide-field microscopy using direct wavefront sensing.

Journal: Opt Lett

Publication Year: 2011

Authors: Oscar Azucena, Justin Crest, Shaila Kotadia, William Sullivan, Xiaodong Tao, Marc Reinig, Donald Gavel, Scot Olivier, Joel Kubby

PubMed link: 21403697

Funding Grants: AO Wide-Field Microscope

Public Summary:
We report a technique for measuring and correcting the wavefront aberrations introduced by a biological sample using a Shack-Hartmann wavefront sensor, a fluorescent reference source, and a deformable mirror. The reference source and sample fluorescence are at different wavelengths to separate wavefront measurement and sample imaging. The measurement and correction at one wavelength improves the resolving power at a different wavelength, enabling the structure of the sample to be resolved.

Scientific Abstract:
We report a technique for measuring and correcting the wavefront aberrations introduced by a biological sample using a Shack-Hartmann wavefront sensor, a fluorescent reference source, and a deformable mirror. The reference source and sample fluorescence are at different wavelengths to separate wavefront measurement and sample imaging. The measurement and correction at one wavelength improves the resolving power at a different wavelength, enabling the structure of the sample to be resolved.